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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/766,835	01/23/2001	Rudolf Wagner	622/43633C3	1560

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CROWELL & MORING
1001 PENNSYLVANIA AVENUE
WASHINGTON, DC 20004

EXAMINER

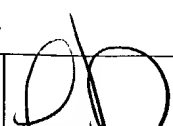
VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/766,835	Applicant(s) WAGNER ET AL.	
	Examiner Lan Vinh	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/5/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 46-102 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 46-102 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 46-55, 59-62, 100 are rejected under 35 U.S.C. 102(e) as being anticipated by Sundar (US 6,224,312).

Sundar discloses a method for processing wafers comprises the steps of:

loading wafers/workpieces via loadlock 112 into a vacuum processing system comprising two stations 100 and 106 receiving wafers from cassettes 109 containing batch of wafers, the system has a mapping system to index the number of wafers in each cassette (col 4, lines 35-42, col 5, lines 1-5), which reads on loading the workpieces into a treatment facility comprising at least two stations operating each on workpiece batches grouped as respective station batches and being different with respect to number of workpieces

handling/transporting the wafers cassettes to and from the stations using a wafer cassette turntable 111 (col 4, lines 59-62, fig.8, fig. 13), which reads on transporting the workpieces to and from the two stations grouped as a transport batch

treating the wafers/workpieces in the processing chambers/stations 106 that is pumped down to vacuum (col 8, lines 20-29)

Regarding claims 46, 47, Sundar discloses using a system controller programmed to move the wafers through the transfer chamber (col 2, lines 40-42)

Regarding claims 48, 49, Sundar discloses using a mapping system to index the number of wafers in each cassette 109 (col 5, lines 1-4), which reads on controlling the size of the station batch using a programmable process controller unit

Regarding claims 50-51, Sundar discloses using a mapping sensor to verify the number of wafers in the cassette before positioning the wafer in the chamber 112/transport chamber (col 5, lines 8-19)

Regarding claim 52-55, Sundar discloses that the optimization of wafer movement using the robot/controller unit resulted in several optimal paths (col 11, lines 42-45, fig. 26), which reads on the step of controlling geometric arrangement of a station batch of at least one stations using a process controller unit.

Regarding claims 59-61, fig. 8 of Sundar shows the cassettes 109 containing the wafers in the station, the cassette can be moved by cassette turntable 111, which reads on the step of providing the workpiece in at least one station of the treatment facility within a mobile magazine.

Regarding claim 62, Sundar discloses providing vacuum isolation of the environment within the chambers/stations in the processing system (col 8, lines 26-30)

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3. Claim 63 is rejected under 35 U.S.C. 102(e) as being anticipated by Sundar (US 6,224,312).

Sundar discloses a method for processing wafers comprises the steps of:

loading wafers/workpieces into a processing system comprising two processing chambers/vacuum stations 100 and 106 (col 4, lines 35-42)

loading and unloading wafers from the chambers/stations using a cassette containing wafers and the cassette turntable (col 4, lines 42-67), which reads on loading and unloading the at least two stations with workpieces grouped as a transport batch

using the wafer mapping sensor to verify the number of wafers and orientation of wafer in the cassette/transport batch before positioning the wafers in the loadock chamber for processing (col 5, lines 8-11)

handling/transporting the wafers cassettes to and from the stations using a wafer cassette turntable 111 (col 4, lines 59-62, fig. 8, fig. 13), which reads on transporting the workpieces to and from the two stations grouped as a transport batch

treating the wafers/workpieces in the processing chambers/stations 106 that is pumped down to vacuum (col 8, lines 20-29)

4. Claim 82 is rejected under 35 U.S.C. 102(e) as being anticipated by Sundar (US 6,224,312).

Sundar discloses a method for processing wafers comprises the steps of:

transferring the cassettes 109 containing wafers to two vacuum stations 106 within a processing system 100 (fig. 13), which reads on vacuum treating the

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wafers/workpiece grouped as respective stations batches within the least two stations of a treatment facility

using a mapping sensor to verify the number of wafers in the cassette before positioning the wafer in the chamber 112/transport chamber (col 5, lines 8-19), which reads on controlling the station batches, controlling the CVD process operation in the process chambers/stations 106

5. Claims 83-99, 102 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (US 6,214,751)

Lee discloses a method for processing wafers comprises the steps of:

processing wafers/workpieces grouped as batches within two vacuum reaction chamber (col 7, lines 11-12), which reads on vacuum treating the wafers/workpiece grouped as respective stations batches within the least two stations of a treatment facility

processing 9 wafers in one reaction chamber and the remaining 7 wafers can be processed in the other reaction chamber, alternately , 9 wafers may be processed in one chamber and 8 wafers may be processed in the other chamber (col 7, lines 6-12), which reads on controllably varying the number of workpieces of the station batches

Regarding claims 83-85, Lee discloses using the software controlling the timing of the cleaning process (col 7, lines 25-26), which reads on controlling the size of the station batch using a programmable process controller unit

Regarding claims 86-92, Lee discloses the step of transporting the wafers/workpieces from the reaction chambers (fig. 1), controlling the number of workpieces of the station (col 7, lines 6-12)

Regarding claims 93-95, Lee discloses processing 9 wafers in one reaction chamber and the remaining 7 wafers can be processed in the other reaction chambers from 25 wafers/batch in a wafer cassette, alternately, 9 wafers may be processed in one chamber and 8 wafers may be processed in the other chamber (col 7, lines 6-12), which reads on the number of workpiece of the transport batches not to exceed/to be an integer fraction of the number of workpiece of a station batch of a transport destination station.

Regarding claims 96-98, Lee discloses loading the wafers/workpieces from a wafer cassette (col 7, lines 46-49), which reads on the step of providing the workpiece in at least one station of the treatment facility within a mobile magazine.

Regarding claim 99, Lee discloses providing vacuum isolation of the environment within the multi-chambers/stations in the processing system (col 5, lines 6-10)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundar (US 6,224,312) in view of Edward et al (US 5,944,857)

Sundar's method has been described above. Unlike the instant claimed inventions as per claims 56-58, 74-76,93-95, Sundar fails to disclose selecting the number of workpiece of the transport batches not to exceed/to be an integer fraction of the number of workpiece of a station batch of a transport destination station.

However, Edward discloses a method for loading and unloading wafers from high vacuum chamber comprises the step of disclose selecting the number of workpiece of the loading station/transport batches of 13 or 25 wafers (col 10, lines 31-35), which reads on selecting the number of workpiece of the transport batches not to exceed/to be an integer fraction of the number of workpiece of a station batch of a transport destination station.

Hence, one skilled in the art would have found it obvious to modify Sundar's method by selecting the number of workpiece of the loading station/transport batches of 13 or 25 wafers as per Edward because Edward states that 13 or 25 wafers is a full standard batch of wafers I position at the loading station (col 10, lines 33-35)

8. Claims 64-81,101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundar (US 6,224,312) in view of Lee (US 6,214,751)

Sundar discloses a method for processing wafers comprises the steps of:
loading wafers/workpieces into a processing system comprising two processing chambers/vacuum stations100 and 106 (col 4, lines 35-42)

loading and unloading wafers from the chambers/stations using a cassette containing wafers and the cassette turntable (col 4, lines 42-67), which reads on loading and unloading the at least two stations with workpieces grouped as a transport batch using the wafer mapping sensor to verify the number of wafers and orientation of wafer in the cassette/transport batch before positioning the wafers in the loadock chamber for processing (col 5, lines 8-11)

handling/transporting the wafers cassettes to and from the stations using a wafer cassette turntable 111 (col 4, lines 59-62, fig.8, fig. 13), which reads on transporting the workpieces to and from the two stations grouped as a transport batch

treating the wafers/workpieces in the processing chambers/stations 106 that is pumped down to vacuum (col 8, lines 20-29)

Unlike the instant claimed invention as per claim 101, Sundar fails to specifically disclose controllably varying the number of workpieces of the transport batch

Lee discloses a method for processing wafers comprises the step of: processing 9 wafers in one reaction chamber and the remaining 7 wafers can be processed in the other reaction chambers from 25 wafers/batch in a wafer cassette, alternately, 9 wafers may be processed in one chamber and 8 wafers may be processed in the other chamber (col 7, lines 6-12), which reads on controllably varying the number of workpieces, the number of workpiece of the transport batches not to exceed/to be an integer fraction of the number of workpiece of a station batch of a transport destination station.

Hence, one skilled in the art would have found it obvious to modify Sundar's method by controllably varying the number of workpieces of the transport batch as per Lee because Lee discloses that his method increases the wafer throughput thus enhancing the productivity of semiconductor device (col 8, lines 12-15)

Regarding claim 64, Sundar discloses using a system controller programmed to move wafers through the transfer chamber following time optimal paths (see abstract)

Regarding claims 65-67, Sundar discloses using a mapping system to index the number of wafers in each cassette 109 (col 5, lines 1-4), which reads on controlling the size of the station batch using a programmable process controller unit

Regarding claims 68-69, Sundar discloses using a mapping sensor to verify the number of wafers in the cassette before positioning the wafer in the chamber 112/transport chamber (col 5, lines 8-19)

Regarding claims 70-73, Sundar discloses that the optimization of wafer movement using the robot/controller unit resulted in several optimal paths (col 11, lines 42-45, fig. 26), which reads on the step of controlling geometric arrangement of a station batch of at least one stations using a process controller unit.

Regarding claims 77-80, fig. 8 of Sundar shows the cassettes 109 containing the wafers in the station, the cassette can be moved by cassette turntable 111, which reads on the step of providing the workpiece in at least one station of the treatment facility within a mobile magazine.

Regarding claim 81, Sundar discloses providing vacuum isolation of the environment within the chambers/stations in the processing system (col 8, lines 26-30)

Response to Arguments

8. Applicant's arguments filed 3/5/2004 have been fully considered but they are not persuasive.

Applicants argue that the cassettes 109 of Sundar are not reachable by the claimed processing stations because in Sundar the vacuum treatment facility is separated from the cassette by the loadlock arrangement. This argument is unpersuasive because as recited in col 8, lines 24-28 of Sundar, Sundar discloses that "each of the processing chambers and loadlock 112 include one or more slit valve openings and slit valves which enable communication between the processing chambers, the loadlock and transfer chamber", fig. 13 also shows the wafers/workpieces are loading between processing chambers and the loadlock, which certainly reads on the limitation of "loading said workpieces via loadlock arrangement into a vacuum treatment facility" as recited in claim 100.

Applicants also argue that Sundar does not teach two workpiece processing stations as required in the present invention because Sundar merely teaches exposing workpieces to vacuum. The examiner disagrees because Sundar's method clearly requires processing chambers 106 to process the wafers (col 7, lines 52-55)

It is argued that Sundar does not teach controllable varying the extent of the transport batch as set forth in claim 101. This argument does not commensurate with the scope of claim 101 since claim 101 does not recite "controllable varying the extent of the transport batch"

Applicants further argue that Sundar does not teach that the workpieces are transported from the cassette 109 to and into the cassette 208 of the loadlock chamber 112 as a transport batch, i.e. that more than one wafer is simultaneously transported between theses addressed cassettes. This argument is unpersuasive because as recited in col 4, lines 35-62 of Sundar, Sundar discloses using the turntable 111 to support one or more wafers cassette for processing in the processing system 100 having processing chambers 106, which reads on "transporting the workpieces to and from said at least two workpieces processing stations grouped as a transport batch" since claim 100 does not specifically require that "more than one wafer is simultaneously transported between theses addressed cassettes"

Applicant's arguments with respect to claim 102 have been considered but are moot in view of the new ground(s) of rejection of claim 102 based on the reference of Lee (US 6,214,751)

9. Applicant's amendment necessitated the new ground(s) of rejection with respect to claims 101, 102 presented in this Office action. The examiner also maintained the rejection of claims 63, 82 and 100 based on Sundar (US 6,224,312). Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LV
July 26, 2004